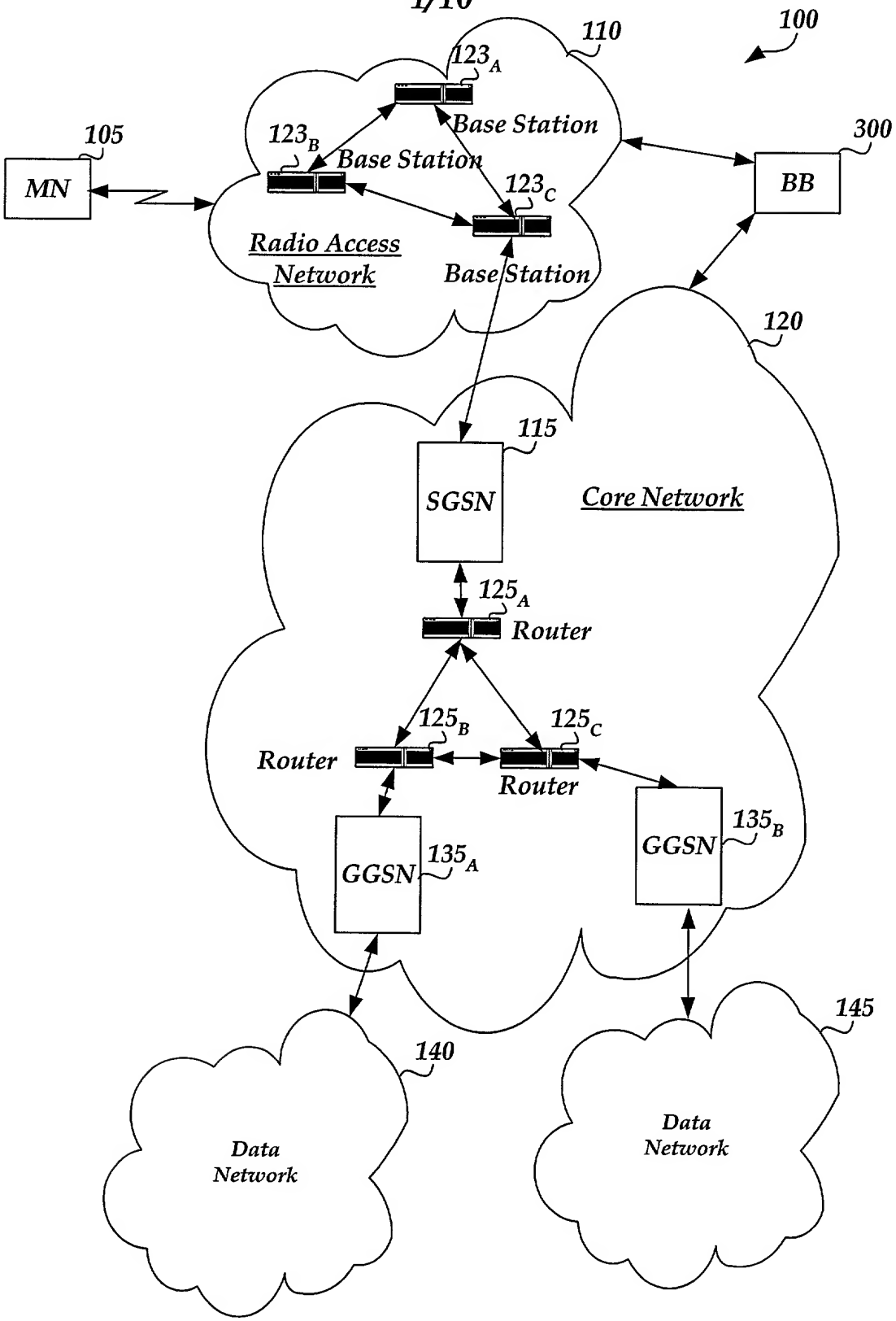

100
110
123_A
Base Station
105
123_B
Base Station
300
MN
BB
123_C
Radio Access Network
Base Station
120
115
SGSN
Core Network
125_A
Router
125_B
125_C
Router
Router
135_B
GGSN
135_A
GGSN
145
140
Data Network
Data Network

Fig.1

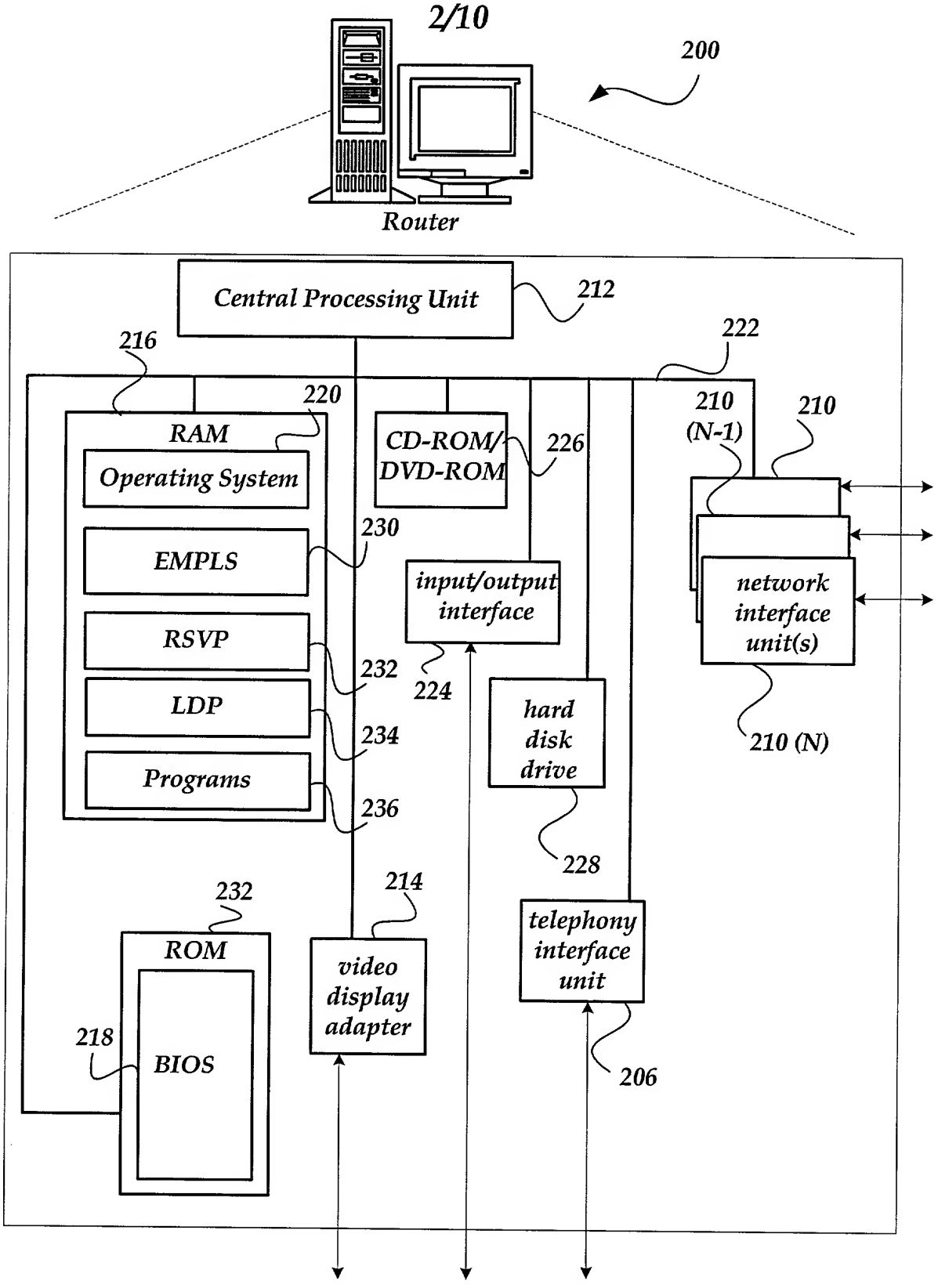

200
Router
Central Processing Unit
212
216
222
220
210
(N-1)
210
RAM
Operating System
CD-ROM/
DVD-ROM
226
EMPLS
230
input/output
interface
network
interface
unit(s)
RSVP
232
224
LDP
234
hard
disk
drive
Programs
236
210 (N)
228
232
214
telephony
interface
unit
ROM
video
display
adapter
218
BIOS
206

Fig. 2A

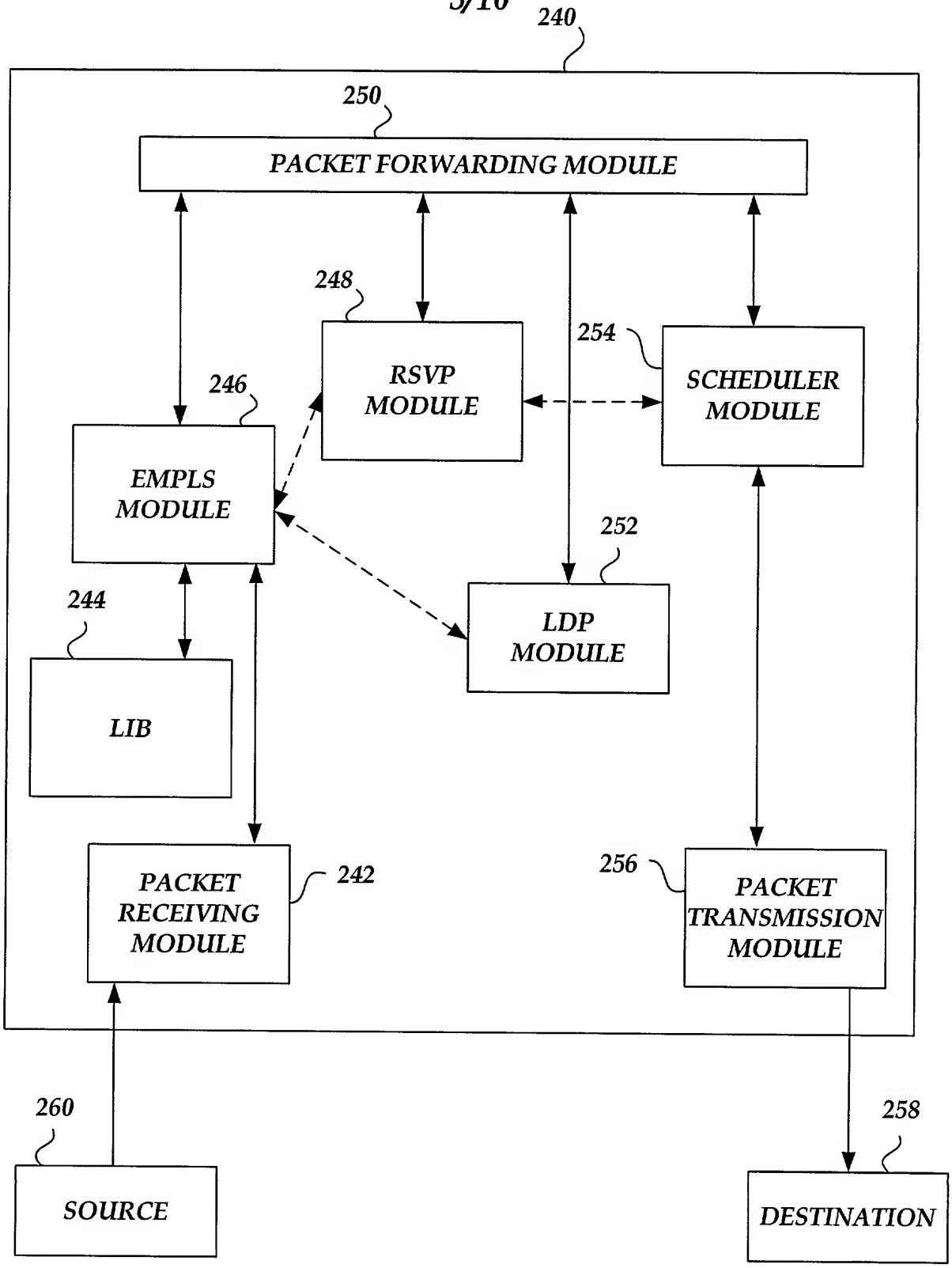
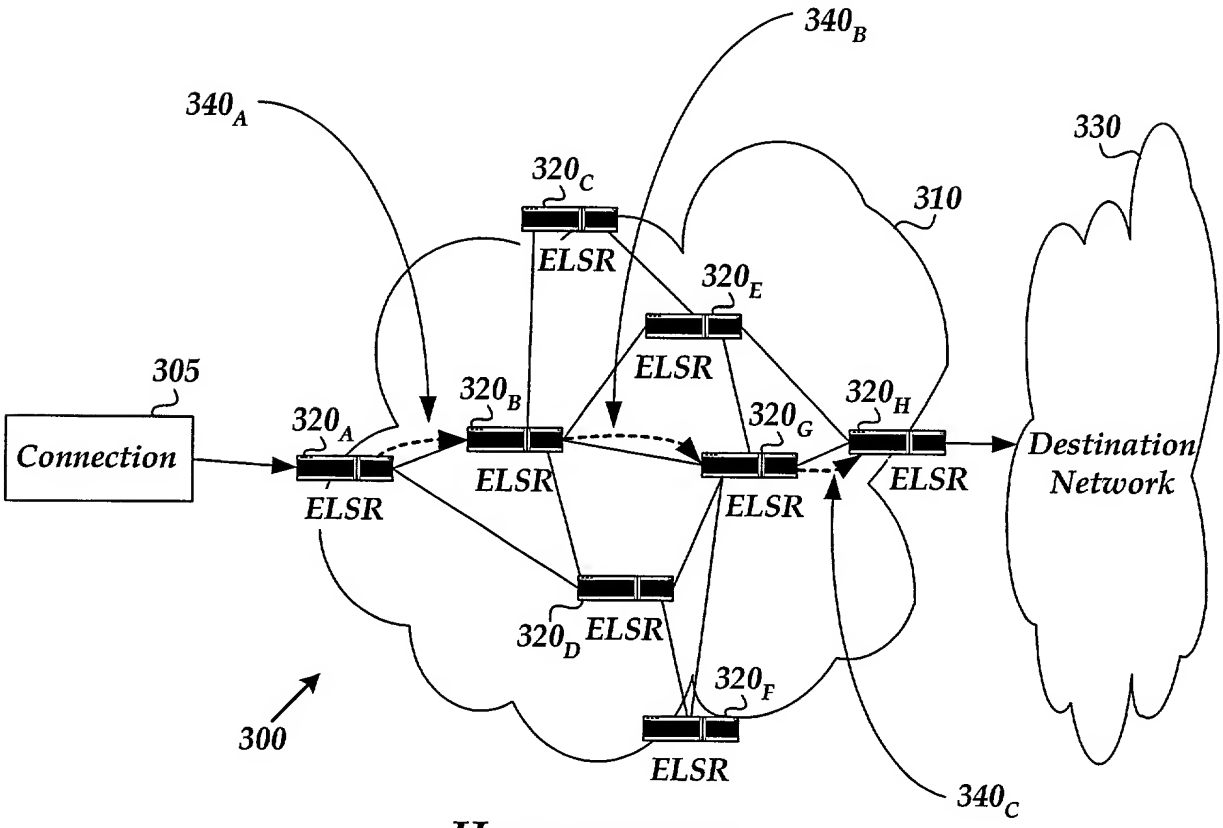
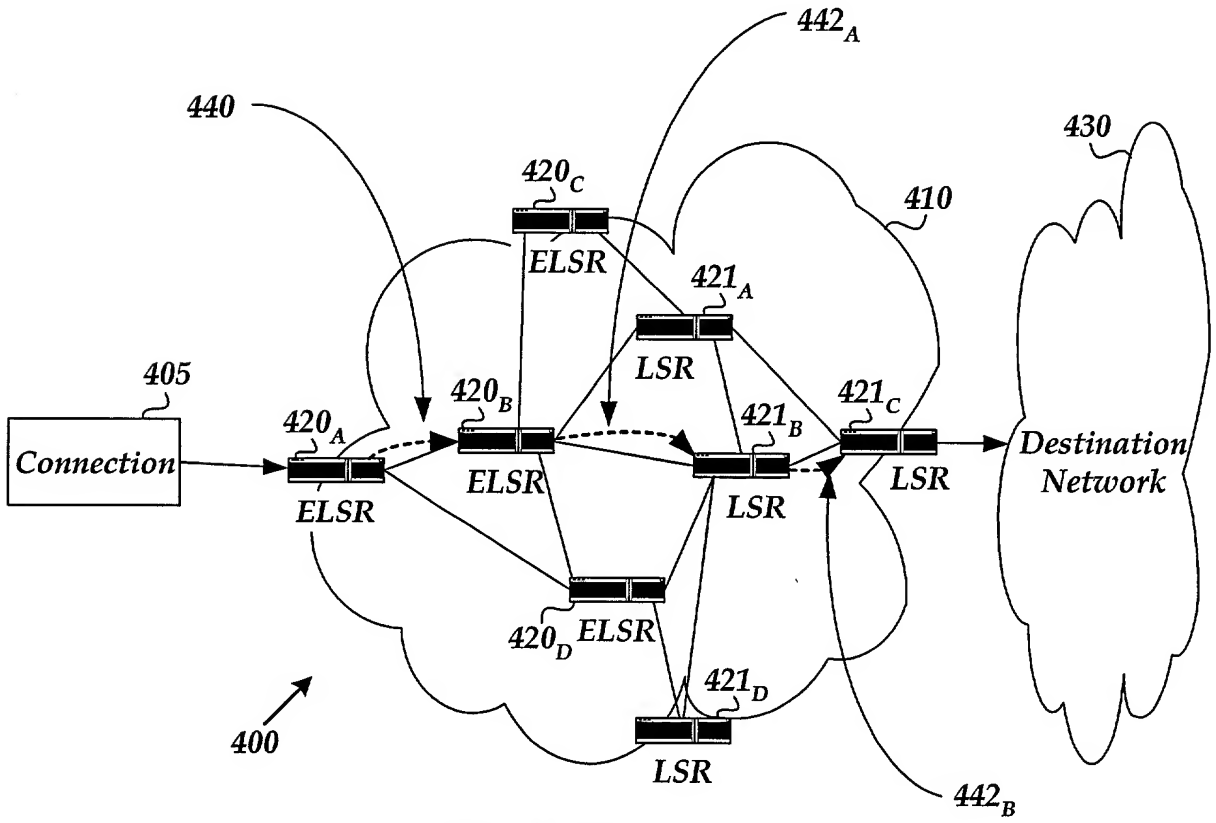

240
250
PACKET FORWARDING MODULE
248
RSVP MODULE
254
SCHEDULER MODULE
246
EMPLS MODULE
252
LDP MODULE
244
LIB
PACKET RECEIVING MODULE
242
256
PACKET TRANSMISSION MODULE
260
SOURCE
258
DESTINATION

Fig. 2B



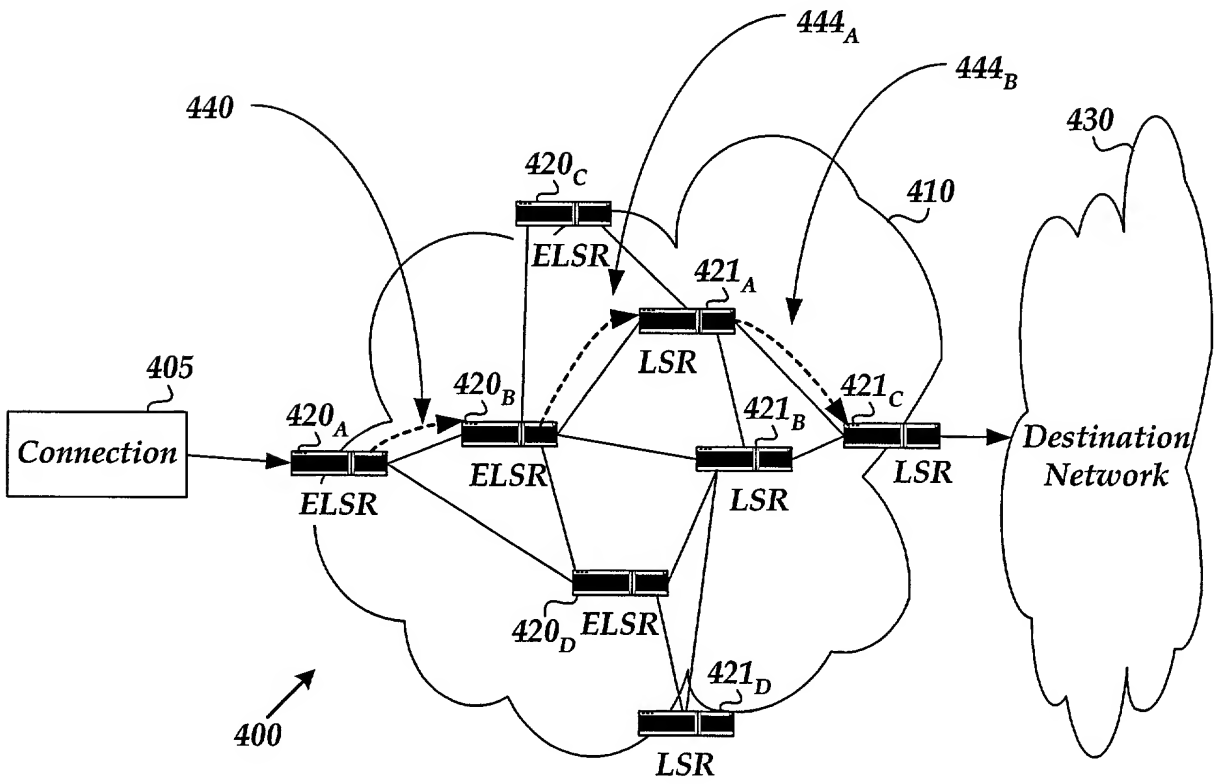
Homogeneous
MPLS Network

Fig.3



Heterogeneous MPLS Network

Fig.4A



Heterogeneous MPLS Network

Fig.4B

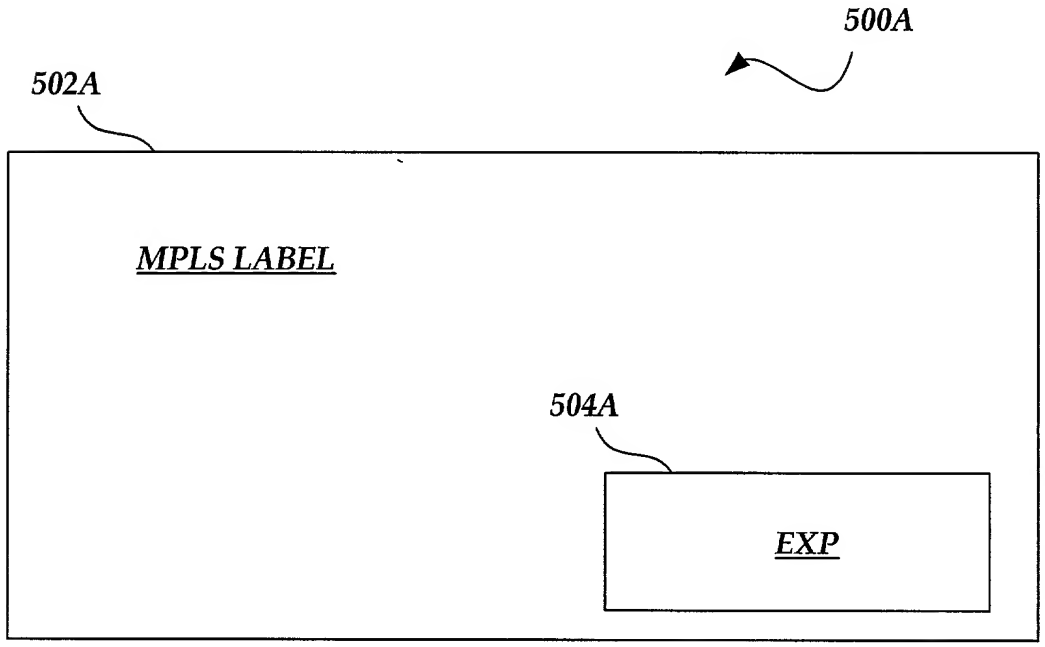

500A
502A
MPLS LABEL
504A
EXP

Fig.5A

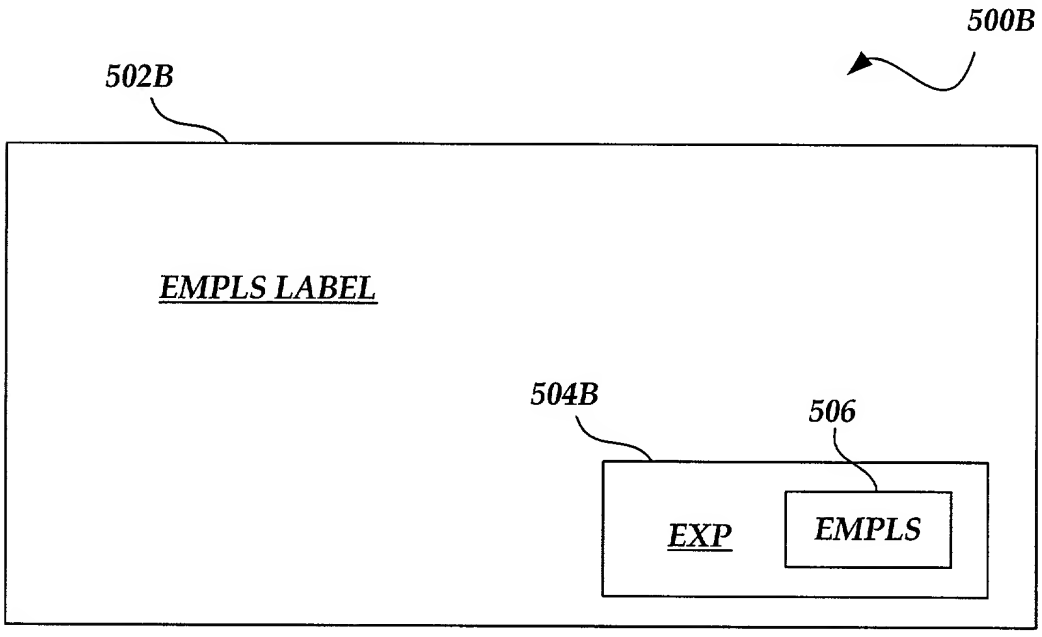

500B
502B
EMPLS LABEL
504B
506
EXP
EMPLS

Fig.5B

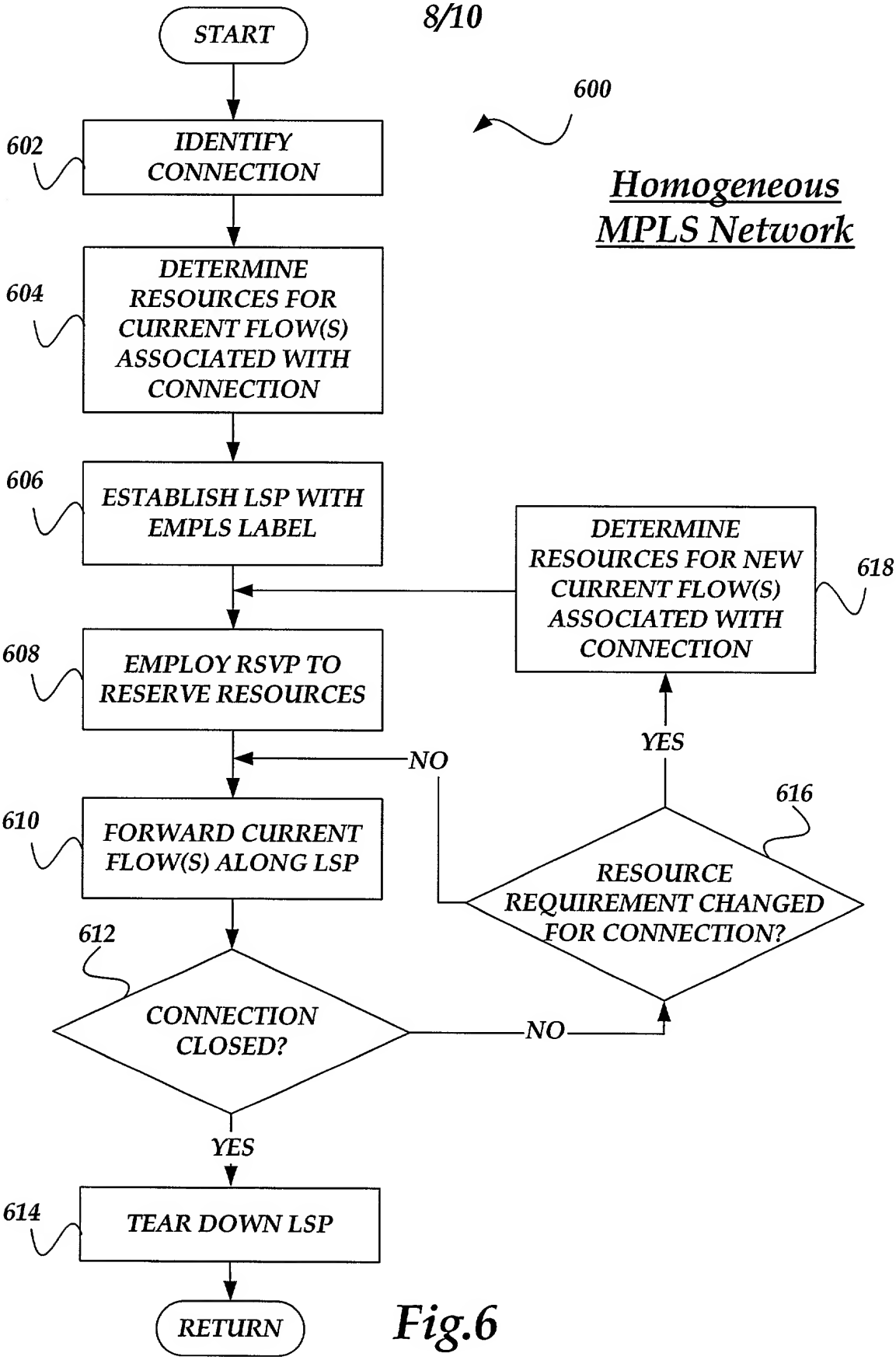

START
600
602
IDENTIFY CONNECTION
Homogeneous MPLS Network
604
DETERMINE RESOURCES FOR CURRENT FLOW(S) ASSOCIATED WITH CONNECTION
606
ESTABLISH LSP WITH EMPLS LABEL
618
DETERMINE RESOURCES FOR NEW CURRENT FLOW(S) ASSOCIATED WITH CONNECTION
608
EMPLOY RSVP TO RESERVE RESOURCES
YES
NO
610
FORWARD CURRENT FLOW(S) ALONG LSP
616
RESOURCE REQUIREMENT CHANGED FOR CONNECTION?
612
CONNECTION CLOSED?
NO
YES
614
TEAR DOWN LSP
RETURN

Fig.6

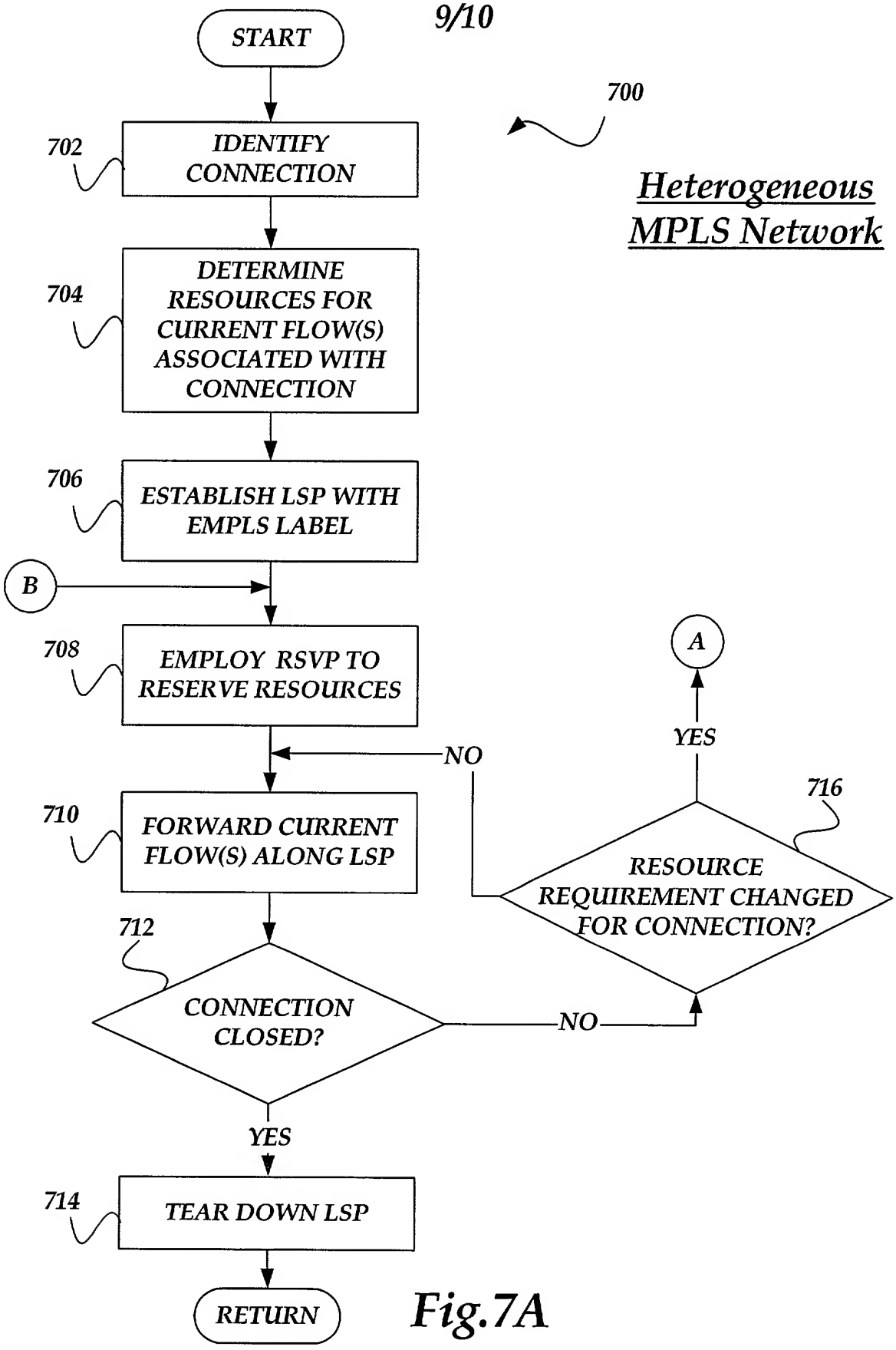

START
700
IDENTIFY CONNECTION
702
Heterogeneous MPLS Network
DETERMINE RESOURCES FOR CURRENT FLOW(S) ASSOCIATED WITH CONNECTION
704
ESTABLISH LSP WITH EMPLS LABEL
706
B
EMPLOY RSVP TO RESERVE RESOURCES
708
A
YES
NO
716
RESOURCE REQUIREMENT CHANGED FOR CONNECTION?
FORWARD CURRENT FLOW(S) ALONG LSP
710
712
CONNECTION CLOSED?
NO
YES
TEAR DOWN LSP
714
RETURN

Fig.7A

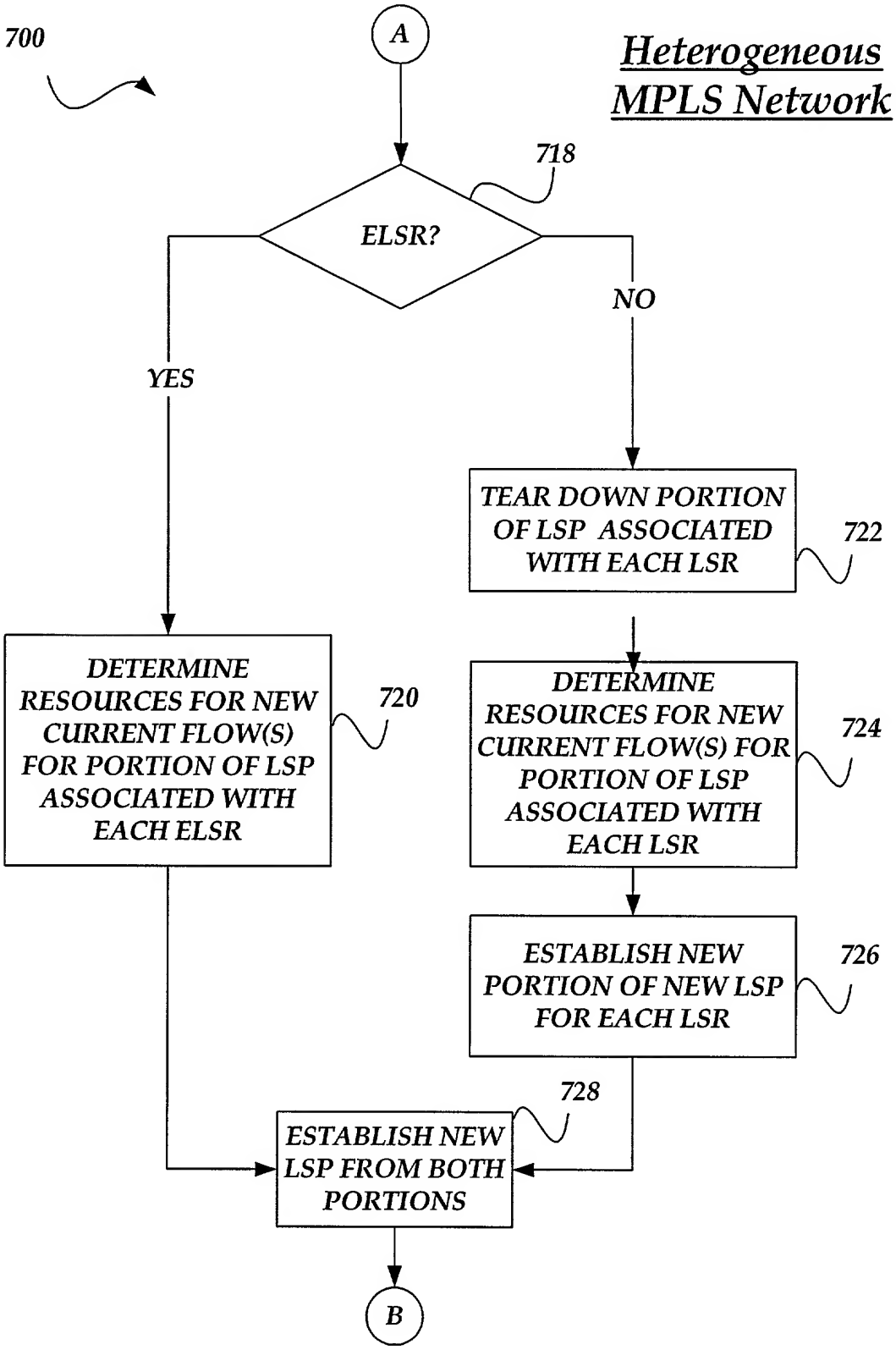

700
A
Heterogeneous MPLS Network
718
ELSR?
YES
NO
TEAR DOWN PORTION OF LSP ASSOCIATED WITH EACH LSR
722
DETERMINE RESOURCES FOR NEW CURRENT FLOW(S) FOR PORTION OF LSP ASSOCIATED WITH EACH ELSR
720
DETERMINE RESOURCES FOR NEW CURRENT FLOW(S) FOR PORTION OF LSP ASSOCIATED WITH EACH LSR
724
ESTABLISH NEW PORTION OF NEW LSP FOR EACH LSR
726
728
ESTABLISH NEW LSP FROM BOTH PORTIONS
B

Fig.7B